



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,459	09/19/2006	Miho Gamba	043888-0511	9980
20277 7590 07/01/2010 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096				
EXAMINER				
SCULLY, STEVEN M				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
07/01/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/593,459

**Applicant(s)**

GEMBA ET AL.

**Examiner**

Steven Scully

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/CD)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**FUEL CELL AND FUEL CELL STACK COMPRISING THE SAME**

Examiner: Scully    S.N.: 10/593,459    Art Unit: 1795    June 28, 2010

**DETAILED ACTION**

1.     The Amendment filed April 19, 2010 has been entered. Claims 1, 6, 7 and 9 have been amended and claims 12 and 13 were newly added. Accordingly, claims 1-13 are pending in the application.
  
2.     The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Priority***

3.     The certified priority document for JP2004-380634 is noted.

***Claim Rejections - 35 USC § 112***

4.     Claim rejection of claims 1, 6, 7 and 9 under 35 U.S.C. 112, second paragraph, are withdrawn because the claims were amended.

***Claim Rejections - 35 USC § 103***

5.     Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohara et al. (US2004/0209148).

With respect to claim 1, Ohara et al. disclose a polymer electrolyte fuel cell comprising a membrane electrode assembly having an anode (2a), a cathode (2b) and a polymer electrolyte membrane (1) disposed therebetween. An anode-side separator (10) and a cathode-side separator (20) are provided. A cooling fluid channel (14b, 24b) is provided between the separators of adjacent fuel cell units. See Figure 11. A fuel gas channel for supplying and exhausting a fuel gas to/from the anode separator and an oxidant gas channel for supplying and exhausting oxidant gas to/from the cathode separator are provided. See Figures 14 and 15. A cathode-side gasket (150) and an anode-side sealing member (180) are provided. Clearance is provided between the cathode (201) and the sealing member (150) represented by  $l_1$ , and clearance between the anode (202) and the sealing member (180) is represented by  $l_2$ . See Figure 43; paragraph [0252]. This configuration ensures discharge of water. See [0081].

Ohara et al. do not disclose the cooling fluid channel, fuel gas channel and oxidant gas channel to be substantially parallel, but disclose the coolant flow field to be perpendicular to the cathode and anode flow fields. However, it would have been obvious to one having ordinary skill in the art at the time of the invention to rearrange the flow fields to be parallel and thus have inlets and outlets on the same sides, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. Upon parallel rearrangement, an upstream portion of the cooling fluid channel would correspond to a region of the anode and/or cathode side gaps and a middle stream portion would correspond with the fuel and oxidant gas channels.

With respect to claim 2, Ohara et al. disclose the polymer electrolyte membrane (203) to have a larger main surface than the electrodes (201, 202). The gaskets sandwich the entire periphery of the polymer electrolyte membrane (see Figure 38). The anode-side gap comprises boundaries of the anode, polymer electrolyte membrane and the anode-side gasket and the cathode-side gap comprises boundaries of the cathode, polymer electrolyte membrane and the cathode-side gasket. See Figure 43.

With respect to claim 3, the limitation is a method of use. Ohara et al. disclose the same configuration as discussed above with respect to claim 1, and thus it is the position of the examiner that the limitations of claim 3 would occur during use of the fuel cell. Further, Ohara et al. disclose the configuration having the clearance gaps ensures discharge of water. See [0081].

With respect to claim 4, Ohara et al. disclose the configuration as discussed above with respect to claim 1, wherein the upstream portions of the cooling fluid channels correspond to the anode/cathode clearance gaps and the middle stream portion correspond to the fuel/oxidant gas channels. See Figs. 34, 36 and 43, for example.

With respect to claim 5, Ohara et al. disclose the anode and cathode clearance gaps formed by continuous sealant members (which appear to have the same shape as applicant's "continuous circular members") having coolant inlet and outlet manifolds. See Figures 7, 9 and 43. The reactant inlet to outlet path is diagonally across the fuel cell stack, and thus both routes of Ohara et al. would be the same length. However, it would have been obvious to one having ordinary skill in the art at the time of the

invention to rearrange the flow field inlets and outlets to be directly across from one another, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

With respect to claims 6 and 7, Ohara et al. disclose the configuration as discussed above with respect to claim 1, wherein the upstream portion of the cooling fluid channel corresponds to first and second routes of the anode/cathode side gaps.

With respect to claim 8, Ohara et al. disclose the configuration as discussed above with respect to claim 1, wherein the streams of the coolant and fuel and oxidant channels correspond to each other.

With respect to claim 9, the limitation is a method of use. Ohara et al. disclose the configuration as discussed above with respect to claim 1. It is the position of the Examiner that the flow fields would thus operate in substantially the same direction in view of *In re Japikse*, as discussed above.

With respect to claim 10, Ohara et al. disclose the channels to have a serpentine structure. See Figs. 34-36.

With respect to claim 11, Ohara et al. disclose a fuel cell stack comprising the fuel cells as discussed above with respect to claim 1. See Figure 11.

With respect to claim 12, Ohara et al. disclose gaps between the sealants 150, 180 and the electrodes 201, 202 as discussed above. See Figure 43. As is depicted for example in Figure 24, the membrane electrode assembly (dotted line) is larger than the flow fields. Thus, the length of the anode and cathode side-gaps would necessarily be longer than the length of the upstream coolant flow field channel.

With respect to claim 13, Ohara et al. do not explicitly disclose the limitation. However, it is the position of the Examiner this limitation is simply a mode of distinguishing the portions of the fuel gas channel and oxidant gas channel that are so-named "the middle stream portion and subsequent portion" of each gas channel, as discussed in the instant specification at paragraphs [0033-0036], and thus does not further limit the product of the fuel cell of claim 1.

### ***Response to Arguments***

6. Applicant's arguments filed April 19, 2010 have been fully considered but they are not persuasive. Applicant argues:

*a) The gap between the anode 2a or cathode 2b and the sealing member 30 or 40 does not correspond to the cooling fluid channel 14b or 24b.*

The Examiner respectfully disagrees. It is the position of the Examiner that it would have been an obvious variation to have the coolant rotated 90 degrees such that the flow field is parallel to the anode and cathode flow fields for the reasons as discussed above with respect to claim 1. Whether or not a portion of the cooling fluid channel is perpendicular to a surface of the anode or cathode gaps, which the Examiner believes to be the point Applicant is making, does not prevent a portion of the cooling fluid channel from being that which is closest to the edges that most extracts heat from the gaps and thus, compared to the remainder of the cooling fluid channel, corresponds to the gaps.

*b) The fuel cell will not operate.*

The Examiner respectfully disagrees. It is unclear from Applicant's arguments why the fuel cell would not operate by rearranging the cooling fluid fields to be, for example, vertical instead of horizontal (where the reactant flow fields are vertical). It remains the position of the Examiner that the rejection is proper and operable because the coolant would still perform its function of cooling.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



***Contact/Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Scully whose telephone number is (571)270-5267. The examiner can normally be reached on Monday to Friday 7:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. S./  
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1795